

REMARKS/ARGUMENTS

Claims 1-24 were pending in the present application. The present response does not add, amend, or cancel any claims, leaving pending in the application claims 1-24. Reconsideration of the rejected claims and consideration of the newly presented claims is respectfully requested.

I. Rejection under 35 U.S.C. §112

Claim 19 is rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Particularly, the claim is objected to as failing to specify the direction in which the etch area has a uniform depth. Applicants respectfully submit that claim 19 depends from claim 18, which states that the “etched area aligned on the longitudinal axis of the diode-laser” has “a maximum depth less than or equal to the total thickness of said upper cladding region.” The limitation that this depth also is uniform should not be indefinite, as the direction and depth of the etched area would be understood to one of ordinary skill in the art and in light of the specification and of the limitations of claim 18. A look to the etched areas in Figure 4 also would be sufficient to understand the depth of the etched feature. Applicants therefore respectfully submit that the claim is not indefinite and request that the rejection be withdrawn.

II. Rejection under 35 U.S.C. §102

Claims 18-22 and 24 are rejected under 35 U.S.C. §102(e) as being anticipated by *Kuniyasu* (US 6,744,797). Applicants’ claim 18 requires a diode-laser having a longitudinal axis, defined by:

- a substrate;
- a lower cladding region a lower waveguide region, an active region including a quantum-well layer, an upper waveguide region, and an upper cladding region, grown in listed order on said substrate, said substrate and said regions grown thereon having two, parallel facets, the distance between said facets defining the length of the diode laser;
- an elongated electrode having a length less than the length of the diode-laser on said upper cladding region, arranged perpendicular to said facets and defining a pumped stripe of said diode-laser, the longitudinal axis of the diode-laser extending through said pumped stripe of the diode-laser; and
- at least one etched area in said upper cladding region of the diode-laser outside said strip section and aligned with said longitudinal axis, said at least one etched area having a maximum depth less than or equal to the thickness of said upper cladding region and having a shape and depth profile selected to provide diverging lens effect for laser radiation circulating in said waveguide-regions

(*emphasis added*). *Kuniyasu* does not disclose such limitations. *Kuniyasu* discloses a semiconductor laser device having a pair of “ridge grooves” formed parallel to the longitudinal axis (see Figs. 1(b)-1(d)), with “current non-injection regions” being formed “between the two ridge grooves” (col. 4, lines 4-14). *Kuniyasu* does not disclose “at least one etched area...aligned with said longitudinal axis...having a shape and depth profile selected to provide diverging lens effect” as required by claim 1. The ridge grooves or “trenches” (identified in the Office Action on p.3) run parallel to the longitudinal axis outside the current non-injection regions of *Kuniyasu*. There is no disclosure in *Kuniyasu* as to how ridge grooves located outside the current non-injection regions can provide a diverging lens effect, or how such an effect could be affected by the shape and depth profile of those grooves. Further, it would not be obvious that ridge grooves outside the current non-injection regions could be used to provide a diverging lens effect with any likelihood of success. As *Kuniyasu* does not disclose, teach, or suggest these limitations, claim 18 and dependent claims 19 and 20, cannot be anticipated or rendered obvious by *Kuniyasu*.

Applicants’ claim 21 requires a diode-laser defined by:

a multi-layer structure including at least one cladding layer; and
an electrode electrically coupled to said cladding layer with at least one end of said electrode being spaced from an end face of the diode laser to define an unpumped section thereof, and wherein said cladding layer includes a recessed area aligned with said unpumped area and having a configuration which modifies the effective refractive index of the unpumped area in order to improve the mode performance of the laser

(*emphasis added*). As discussed above, *Kuniyasu* discloses ridge grooves outside the current non-injection regions, and there is no disclosure, teaching, or suggestion as to how these grooves outside the non-injection region could modify the “effective refractive index of the unpumped area” as required by Applicants’ claim 21. As such, *Kuniyasu* cannot anticipate or render obvious claim 21 and dependent claims 22 and 24.

Applicants therefore respectfully request that the rejection with respect to claims 18-22 and 24 be withdrawn.

III. Rejection under 35 U.S.C. §103

Claims 1, 3-6, 8-17, and 23 are rejected under 35 U.S.C. §103(a) as being obvious over *Kuniyasu* in view of *Tanaka* (US 6,430,204). Applicants’ claim 1 requires a diode-laser having a longitudinal axis, defined by:

a substrate having two facets, the distance between said facets defining the length of the diode laser;

a lower cladding region, a lower waveguide region, an active region including a quantum-well layer, an upper waveguide region, and an upper cladding region, formed on said substrate;

an elongated electrode electrically coupled to said upper cladding region and located between said facets and defining an elongated pumped section of the diode laser, said electrode having a length less than the length of the diode-laser thereby leaving at least one unpumped section adjacent said diode-laser at a first end of said electrode, the longitudinal axis of the diode-laser extending through said pumped and unpumped sections of the diode-laser, said **quantum-well layer having a higher bandgap in said unpumped section than in said pumped section;** and

at least one etched area in said upper cladding region of said unpumped section of diode-laser, said etched area aligned on the longitudinal axis of the diode-laser and having a maximum depth less than or equal to the total thickness of said upper cladding region.

(*emphasis added*). Such limitations are neither taught nor suggested by *Kuniyasu* and *Tanaka*, either alone or in combination. As recognized in the Office Action on page 6, *Kuniyasu* does not teach a quantum well layer having a higher bandgap in said unpumped section than in said pumped section. *Tanaka* is cited as teaching an un-pumped region at a higher bandgap than the pumped region (OA p. 6, referring to col. 20 lines 12-15 and 29-34), but this section of *Tanaka* is related to the waveguide layer (col. 19, lines 65-67; col. 20, lines 29-34). *Tanaka* does not teach or suggest the quantum-well layer having a higher bandgap in the unpumped section than in the pumped section. Further, neither reference teaches or suggests “at least one etched area in said upper cladding region of said unpumped section” as required by claim 1. As such, claim 1 and dependent claims 3-6 and 8-13 cannot be rendered obvious by *Kuniyasu* and *Tanaka*.

Applicants’ claims 14 and 17 also require “said quantum-well layer having a higher bandgap in said unpumped section(s) than in said pumped section” and “at least one etched area in said upper cladding region of each of said unpumped section(s),” such that claims 14 and 17, as well as dependent claims 15-16, are not rendered obvious by *Kuniyasu* and *Tanaka*.

Claim 23 depends from claim 21, which is not rendered obvious by *Kuniyasu* as discussed above. *Tanaka* fails to make up for the deficiency in *Kuniyasu* with respect to claim 21, as *Tanaka* also fails to teach or suggest how the grooves of *Kuniyasu* located outside the non-injection region could modify the “effective refractive index of the unpumped area.” As such, claim 23 cannot be rendered obvious by *Kuniyasu* and *Tanaka*.

Claims 2 and 7 are rejected under 35 U.S.C. §103(a) as being obvious over *Kuniyasu* in view of *Tanaka* and further in view of *Nakatsuka* (US 4,871,175). Claims 2 and 7 depend from claim 1, which is not rendered obvious by *Kuniyasu* and *Tanaka* as discussed above. *Nakatsuka*

is cited as teaching an etched area having biconcave shapes (OA p. 9). Such teaching does not make up for the deficiencies in *Kuniyasu* and *Tanaka* with respect to claim 1, however, as *Nakatsuka* does not teach or suggest a "quantum-well layer having a higher bandgap in said unpumped section than in said pumped section," and the etched areas of *Kuniyasu* are not in the "unpumped section" as required by claim 1, such that it does not matter whether the grooves are biconcave or not. As such, claim 1 and dependent claims 2 and 7 cannot be anticipated by *Kuniyasu*, *Tanaka*, and *Nakatsuka*, alone or in any combination.

Applicants therefore respectfully request that the rejections with respect to claims 1, 3-6, 8-17, and 23 be withdrawn.

IV. Amendment to the Claims

Unless otherwise specified, amendments to the claims are made for purposes of clarity, and are not intended to alter the scope of the claims or limit any equivalents thereof. The amendments are supported by the specification and do not add new matter to the specification.

V. Conclusion

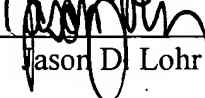
In view of the above, it is respectfully submitted that the application is now in condition for allowance. Reconsideration of the pending claims and a notice of allowance is respectfully requested.

The Commissioner is hereby authorized to charge any deficiency in the fees filed, asserted to be filed, or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our Deposit Account No. 50-1703, under Order No. COHD-5020. **A duplicate copy of the transmittal cover sheet attached to this Response to Office Action Mailed June 13, 2005, is provided herewith.**

Respectfully submitted,

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Dated: September 9, 2005

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